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The Citrus Industry

THE ONLY PUBLICATION IN THE WORLD
DEVOTED EXCLUSIVELY TO CITRUS FRUITS

Issued Monthly

Representative of every interest—
Representing no special interest.

Vol. 1 JULY, 1920 No. 7

Some of the important citrus troubles are shown on the Grapefruit leaf used as our trade mark. At left is the adult White Fly, next the Rust Mite, near the tip the Purple Scale, and in upper middle the disease known as Scab of Grapefruit. All but Scab are shown more or less enlarged.

FICO INSECTICIDES

Mix With Hard Water

FICO 60--For White Flies and Scale Insects, can be used with Lime-Sulphur.

FICO 20--For Cottony Cushion Scale and Mealy Bugs.

LIME-SULPHUR SOLUTION--For Spiders, Mites and Scab.

FICO-SULFUR--For same purpose as Lime-Sulphur Solution.

Cut Out Spray Troubles by Using Fico Insecticides

Florida Insecticide Company

Apopka and Haines City, Florida

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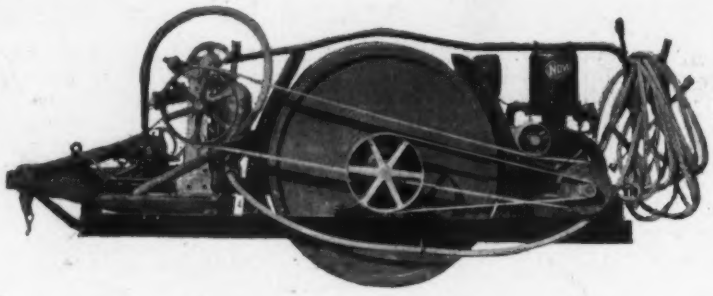

LEFT HAND SIDE, SHOWING BELT TRANSMISSION, AGITATOR, ETC.

Our new Mechanical Agitator insures most perfect mixture, while tank is standing still as well as when in motion. Its many users in Florida are all boosters for it. They agree that after using it they would not go back to the old type of wheel-mounted sprayers under any condition.

IT PROVIDES:

Simplicity
Proper Suspension
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Maximum Power for Spraying
Small Expense of Upkeep
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Light Draft
Short Turning Radius
Accessibility of Parts
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Absence of Excessive Vibration

Would-be imitators try to avoid liability for infringement on our patent by adding a wheel or wheels, thereby destroying the advantage of the TRUE ROLLER SPRAYER over the WHEEL MOUNTED TYPE, and yet claim the advantages of the ROLLER type, which they thus admit they would like to get the benefit of.

Don't accept an imitation or substitute. THE VAN FLEET ROLLER SPRAYER HAS BEEN PROVED A SUCCESS IN ACTUAL OPERATION. Our new 1920 model is a great improvement over previous models. Send for illustrated circular, with prices.

The VAN FLEET COMPANY,

R. A. ELLIS, Manager,

Florence Villa, Florida.

Important Features of Transportation Act of 1920

Every grower and shipper of citrus fruits is interested directly in the workings of the recently enacted transportation act, yet the bill itself and the many technical articles which have been written about it, are so complicated that few laymen have been able to grasp in its entirety the provisions of the bill.

In order that these provisions may be placed before the lay reader in such a simple and condensed form that they may be easily understood, the following summary is given in the belief that it will aid in bringing out the strong and weak points of the bill as no lengthy or technical paper could do:

1—This Act was the result of conference report on the Esch bill in the house of representatives and the Cummins bill in the senate.

2—Federal control ceased March 1, 1920.

3—The guaranty of earnings during federal control shall continue for six months, or until Sept. 1, 1920—this guaranty based on one-half of the average yearly earnings for the years 1915, 1916 and 1917.

4—Carriers desiring guaranty were required to file request by March 15, 1920.

5—Any earnings above the guaranty are to be paid into the United States treasury.

6—The guaranty covers express companies also, if they desire.

7—The period of federal control shall not be computed as a part of the period of limitation in actions against carriers or in claims for reparation for causes of action arising prior to federal control.

8—The indebtedness of the carriers to the United States for capital account expenditures are to be funded over 10 years at 6 per cent. Other indebtedness to the United States to be evidenced by 1-year, 6 per cent notes.

9—All rates in effect at time of termination of federal control to remain in effect until changed by state or federal authority. Prior to Sept. 1, 1920, no rate shall be reduced except with the approval of the Interstate Commerce Commission.

10—A revolving fund of $300,000,000 is appropriated for loans to the carriers. They may apply for 5-year loans at 6 per cent.

11—The bill provides: "It shall be the duty of all carriers and their officers, employes, and agents to exert every reasonable effort and adopt every available means to avoid any interruption to the operation of any carrier growing out of any dispute between the carrier and the employes—."

12—It provides that disputes shall first be considered and, if possible, decided by conference between representatives of the carriers and the employes.

13—It provides for railroad boards of labor adjustment to be established by agreement between the carriers and the employes, to which is to be referred any dispute involving grievances, rules or working conditions (not wages) not decided by conference directly between the carriers and employes.

14—The labor board is set up to be composed of nine members—three, constituting the labor group, to be appointed by the president of the United States from not less than six nominees chosen by the employes. Three members, constituting the management group, appointed by the president from not less than six nominees made by the carriers. Three members, constituting the public group, to be appointed by the president.

15—Members of the labor board receive an annual salary of $10,000 from the United States.

16—The railroad labor board hears matters which the railroad boards of labor adjustment do not decide concerning disputes involving grievances, rules or working conditions, and hears questions regarding wages or salaries which are not settled in the direct conferences between the carriers and employes.

17—The labor board may, upon its own motion, suspend any wage agreement made directly between the carriers and their employes, if it is of the opinion that same involves such an increase as will be likely to necessitate a substantial readjustment of the rates of any carrier; in such an event, it enters into a hearing and makes a decision on the matter.

18—Decisions by the labor board require the concurrence of at least five of the nine members. If the matter concerns wages or salaries, at least one of the representatives of the public shall concur.

19—"All decisions of the labor board shall be entered upon the records of the board and copies thereof, together with such statements of facts bearing thereon as the board may deem proper, shall be immediately communicated to the parties to the dispute, the president, each adjustment board, and the commission, and shall be given further publicity in such manner as the labor board may determine."

20—The act provides that all decisions shall establish rates of wages, salaries and standards of working conditions which in the opinion of the board are just and reasonable, taking into consideration among other relevant circumstances:

1—The scale of wages paid for similar kinds of work in other industries;

2—The relation between wages and the cost of living;

3—The hazards of the employment;

4—The training and skill required;

5—The degree of responsibility;

6—The character and regularity of the employment; and

7—Inequalities of increases in wages or of treatment, the result of previous wage orders or adjustments.

21—The central offices of the labor board will be in Chicago, but it may meet at such other places as it may determine.

22—The board "shall investigate and study the relations between carriers and their employes, particularly questions relating to wages, hours of labor, and other conditions of employment and the respective privileges, rights, and duties of carriers and employes, and shall gather, compile, classify, digest, and publish, from time to time, data and information relating to such questions to the end that the labor board may be properly equipped to perform its duties under this title and that the members of the adjustment boards and the public may be properly informed."

23—The board is authorized to subpoena witnesses and require the production of any book, paper, document, or other evidence from any place in the United States.

24—The Interstate Commerce

commission is given authority in cases of shortage of equipment, congestion of traffic, or other emergency to suspend the operation of any and all rules, regulations or practices and to make directions without regard to the ownership of the property for the handling of matters during such emergency as in its opinion will best promote service in the interest of the public. This includes locomotives, cars and other vehicles, and terminals.

25—The commission may direct the handling, routing and movement of traffic over other roads if the carrier over which routed is unable to transport it properly.

26—No carrier shall undertake the extension of its railroad or the construction of a new line of railroad nor abandon any portion of its line without authority of the interstate commerce commission.

27—The commission may require any carrier to provide itself with safe and adequate facilities, and to extend its line or lines.

28—The above two paragraphs shall not apply to the construction or abandonment of spur, industrial, train, switching or side tracks located wholly within one state.

29—The bill provides that where a carrier has reduced its rates to compete with the water route, it shall not be permitted to increase such rates unless the commission finds that the proposed increase rests upon changed conditions other than the elimination of water competition.

30—The interstate commerce commission may authorize carriers to pool their freights and earnings to any extent considered by the commission to be in the interest of better service to the public.

31—The commission may approve the acquisition by a carrier of the control of any other carrier, either under lease or by purchase of stock or in any other manner not involving consolidation of the carriers into a single system.

32—The bill provides that the commission shall prepare a plan for the consolidation of the railway properties of the United States into a limited number of systems. When this plan is adopted, it shall be lawful for carriers to consolidate their properties in harmony with the plan.

33—It is provided that the obligations at par of any consolidated properties shall not exceed the value of the properties as determined by the commission.

34—These consolidations when approved by the commission, may be made notwithstanding any state law to the contrary.

35—The legislation relieves the carriers from the operation of the "anti-trust laws" in bringing about consolidations.

36—The bill gives the interstate commerce commission authority, after joint hearings with state authorities, to prescribe interstate rates and to remove any discrimination against interstate traffic.

37—The commission is authorized to establish through routes and joint rates on traffic, and to prescribe the divisions between the carriers.

38—The legislation provides that the commission, in exercising its power to prescribe just and reasonable rates, shall establish or adjust same so that carriers as a whole, or as a whole in certain groups or territories as the commission may designate, will, under honest, efficient and economical management, earn an aggregate annual net income equal, as nearly as may be, to a fair return upon the aggregate value of the property held for and used in the service of transportation: Provided, that the commission shall have reasonable latitude to modify or adjust any particular rate which it may find to be unjust or unreasonable, and to prescribe different rates for different sections of the country.

39—The commission shall from time to time determine and make public what percentage of the aggregate property value constitutes a fair return thereon, except that, during the two years beginning March 1, 1920, the percentage is fixed at 5½%, to which the commission may, at its discretion, add ½ to 1% to make provision for improvements, betterments or equipment, chargeable to capital account.

40—The value of the properties of the carriers shall be determined by the commission from time to time and as often as may be necessary.

41—The bill provides that where the carrier, in any year, earns in excess of 6% of the value of his property, one-half of such excess shall be placed in a reserve fund maintained by such carrier, and the remaining one-half to be paid to the interstate commerce commission to establish a general railroad contingent fund.

42—After a carrier has accumulated a reserve fund equal to 5% of the value of its property, it may use its portion of the excess income for any lawful purpose.

43—The general railroad contingent fund shall be administered by the commission and used in furtherance of the public interest, either by making loans to carriers to meet expenditures for capital account or to refund maturing securities originally issued for capital account, or by purchasing of transportation equipment and facilities and leasing the same to carriers.

44—All such loans shall bear interest at the rate of 6%, and equipment purchased by the commission and leased to carriers will be leased at rental charges sufficient to at least pay a rent of 6% on the investment, plus allowance for depreciation.

45—"The provisions of this section shall not be construed as depriving shippers of their right to reparation, in case of overcharges, unlawfully excessive or discriminatory rates, or rates excessive in their relation to other rates, but no shipper shall be entitled to recover upon the sole ground that any particular rate may reflect a proportion of excess income to be paid by the carrier to the commission in the public interest under the provisions of this section."

46—The bill provides that, except by authority of the commission, it shall be unlawful for any carrier to issue any share of capital stock, or any bond, or other evidence of indebtedness, or to assume any obligation or liability as lessor, lessee, guarantor, indorser, surety, or otherwise, in respect of the securities of others. This does not apply to notes to be issued by the carrier maturing in not more than two years after date and aggregating not more than 5% of the par value of the securities of the carrier then outstanding. The carrier shall notify the commission of the issuing of such notes.

47—After Dec. 31, 1921, it shall be unlawful for any person to hold the position of officer or director of more than one carrier, unless such holding shall have been authorized by order of the commission, upon due showing, in form and manner prescribed by the commission, that neither public nor private interests will be adversely affected thereby.

48—The interstate commerce commission is enlarged to eleven members and their compensation increased to $12,000 annually.

Alva Citrus Growers to Erect New Packing House

At a recent meeting of the Alva Citrus Growers Association it was decided unanimously to begin the erection at once of a five-car-a-day two unit packing house.

EXCHANGE SUPPLY COMPANY

The Exchange Supply Company announces the acquisition by purchase of the Warnell Lumber & Veneer Co., with headquarters at Plant City. The properties thus acquired will be operated by the Exchange Supply Co. for the production of boxes for the shipment of citrus fruits by the various local associations and members ot the Florida Citrus Exchange, which this company exclusively serves.

EXCHANGE SUPPLY COMPANY
J. H. ROSS, President

Through purchase of all the outstanding capital stock of the Warnell Lumber & Veneer Company, all the properties of that company are acquired, including the large veneer and crate mill at Plant City, together with warehouses, mill, and other buildings at that point, the company's timber holdings and saw mill at Fort Green, with the privately-owned Warnell logging road, four locomotives, log wagons, mules, and miscellaneous equipment. It is estimated that these facilities, added to those already in operation by the Exchange Supply Company, will amply meet the requirements for box manufacture of the members of the Florida Citrus Exchange, while the timber reserves at present owned or under option will supply material for this purpose for many years to come.

DIRECTORS OF EXCHANGE SUPPLY COMPANY:

J. H. ROSS, President, Winter Haven
D. C. GILLETT, Vice-President, Tampa
C. E. STEWART, JR., Sec'y-Treas.,
W. W. BIRCHFIELD. St. Petersburg
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C. H. WALKER, Bartow
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EXCHANGE SUPPLY COMPANY

Serving only members of the

FLORIDA CITRUS EXCHANGE

Florida Citrus Exchange Saves Money to Growers on Their Grove Supplies

The Florida Citrus Exchange helps its members to produce their fruit for less as well as to sell it for more than do non-cooperating growers.

Members of the Florida Citrus Exchange save money by combining their buying power for fertilizers, spray materials and all grove and packing house supplies in a money-saving way.

The economies effected by the Exchange Supply Company enable members of the Florida Citrus Exchange to save enough on supplies to cover the selling of their fruit crops, thus really giving them the service of the sales department of the Exchange free of charge.

New members who come in now will be welcomed by the growers who form the Florida Citrus Exchange. For full information write tee business manager at Tampa, or call on manager of nearest sub-exchange.

ORANGES Sealdsweet GRAPEFRUIT

FLORIDA CITRUS EXCHANGE

Eleven years of unqualified success. Proven stability. Increasing advantages to members

The Citrus Industry

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Citrus Development in South Texas

By the late D. F. Cameron

I have recently returned from a business visit to the Brownsville District of Texas, or as they call it down there, "The Valley District," and in accordance with your request, I will endeavor to give your readers some idea of that section and of the citrus development and possibilities there.

The Brownsville district comprises some 250,000 acres of land, of which about two-thirds is in Cameron county and the remaining one-third in Hidalgo county. There are quite a number of thriving towns on the main line railroad, Harlingen being the most northerly one, San Benito next and Brownsville at the extreme south on the Rio Grande river and is the county seat of Cameron county. On the branch lines the towns are Mercedes, San Juan and Donna. On another branch line is the town of Edinborough.

This district is well taken care of from an irrigation standpoint by a project owned by the irrigation district. The water is pumped by large centrifugal pumps from the Rio Grande river and carried by main canals, laterals and sub-laterals to every acre of ground within the irrigation district. The land without water grows nothing but mesquite and cactus. After being cleared and subjected to irrigation, it becomes the most fertile soil that I know of anywhere. There is absolutely no fertilizer used for crops, either citrus or otherwise.

There are approximately one hundred acres in this district in very small groves that run from seven to nine years old which were planted long before there was any irrigation system in the district and which were irrigated from small wells. These trees are all doing well and bearing heavy crops. Their fruit is very similar to that grown on the trees in Florida. They do not get the color of the California fruit, but approximately that of Florida, inside and out. The old objection to the use of Florida oranges, "that one had to get in a bath tub to eat them," applies also to the Texas fruit.

What fruit is grown in the Brownsville district is sold exclusively in the local markets and practically all of it to tourists by the dozen at fifty cents a piece for grapefruit and twenty-five cents each for oranges.

There are a great number of very large developments now under way. One of them, the El Jardin, near Brownsville, has spent an enormous amount of money in preparing its land, clearing, etc., and is planting approximately twenty-five thousand trees this year. Large tracts of very close-in lands have been sold at $500 an acre for the raw land that is within three miles of the town, and three hundred to three hundred and fifty dollars per acre for the same kind of land lying a farther distance from town.

The Babcock company has laid out ten thousand acres near Harlingen. This land has all been cleared and is now being planted with a five-acre grove on each forty acre tract on one-half of the acreage, and with a ten-acre grove on each forty in the other half of this immense holding. The price asked for this land, cleared, plowed, ready for irrigation and with the five-acre grove to each forty, is $1,500 per acre straight through for the entire forty. Where a ten-acre grove is planted on each forty, the price with the same conditions is $1,750 per acre.

Each of the large development companies have built a club house and quite a number of beautiful bungalows around the community center, and while I was there not only the club houses and bungalows were filled, but there were from four to six Pullmans on the siding at each one of these developments to take care of the overflow of people, prospective buyers. These prices for land seem exceptionally high to we people of Florida, but they are sold off at these prices and new people are going in there every day.

A year ago the town of Harlingen did not contain one dozen houses. Today there are probably two hundred and fifty houses and many

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Orange Culture in California

By Alvin Fox, Horticulturist

In view of the vast number of new groves which will be planted in California during the coming season and the great number of newcomers who are interested in grove properties, it occurs to me that a practical paper on the proper culture of the orange in California should be of timely interest.

The orange, being an evergreen, may be transplanted at any time, but from April to June is the best season, when the ground is warm and the tree is at its period of greatest strength and root power. The orange is supersensitive to exposure of its roots and for this reason the handling of the young trees differs from that of ordinary orchard trees. Exposure of the roots or careless planting will doom the tree to slow, sickly growth or kill it outright.

There are two principal methods by which trees may be transplanted from the nursery to a permanent place in the orchard. First, there is the balling system. A narrow trench is made along a row of nursery trees at a distance of about six inches. The tap root is cut about 18 inches deep. Then with a sharp spade the earth is cut out, leaving in it the tree. The leaves of a tree taken up by this process will hardly wilt. Second, there is the puddling system. Where the soil is so loose that balling is impossible, a hole is dug around the nursery tree and filled with water. Thus loosened, the tree with its roots is lifted out without difficulty. Many prefer this system as it is less expensive and gives the trees larger and more roots.

Many growers hold that trees taken from the nursery should be topped and the branches so cut that in starting new growth they will form a fine shaped head. This, they say, prevents the evaporation that takes place so rapidly when the leaves are allowed to remain on the young trees. When the roots have taken a firm hold in the new soil and resumed their natural functions, they can take care of all the new leaves which put forth.

A common and harmful practice in planting trees with loose roots is to place the tree in the hole, fill the hole with soil and water, and them tramp on it to pack the earth. As the roots are covered with thick mud, they will stick together, and although the tree may grow, even with this handicap, it will not do nearly as well as when the roots are extended with care. The process is simple. The hole should be filled about half full of loose earth, which easily admits the tap root of the tree by slight pressure of the hand. Then the lateral roots are spread and the soil is lightly pressed. Heavy tramping is not necessary, as the water settles the dirt and keeps the roots in place. As soon as the water in the basin has disappeared, the basin is covered with loose soil. This will prevent evaporation and keep the tree from leaning over. Newly transplanted stock, in case of either a cold or hot spell, may be protected by wrapping with old newspapers.

Experience has demonstrated that in the California climate with its long dry period, and in the dry soils, in which citrus fruits attain their best condition, low pruning protects the trees from the sun and better retains the moisture in the earth around the roots. The fruit of a low pruned tree is more easily and cheaply gathered than that of a high pruned tree.

Different varieties of oranges, or the same in different localities, are picked in differing seasons, and the proper time for pruning is after the removal of the crop. At all seasons of the year, however, superfluous sprouts and stray branches that threaten to throw the tree out of balance, should be removed without delay. That the knife should be very sharp is essential, and all cuts made with a saw should be pared down smooth with a sharp knife, then waxed over and painted with gum shellac in proper solution to spread easily.

The young growth should be clipped with the definite idea of developing a close and systematic head. Suitable clipping during the early and rapid stages of growth of sprouts and stray branches should obviate almost entirely the need of pruning.

Propping of overladen trees is an essential feature of grove work. Adjustable props made of wood have taken the place of the old style willow poles. The props are so arranged that the ends rest under the tree and do not interfere with the cultivation as they did when placed surrounding the tree on the outside.

Stock may be improved by budding. Care should be taken in buying nursery stock that the trees be true to name, but if, upon coming into bearing, they are not up to standard or do not bear well, they should be cut back and budded over. Many different varieties of oranges may be grafted on one tree. An orange tree may be budded to lemon, or a lemon tree to oranges, according as one crop is more profitable than the other.

The culture of oranges in California should only be attempted in districts where irrigation is possible. The tree is a native of the tropical forests where it grows in warm soil and obtains abundant moisture, and its successful culture in California, which lacks summer rains and moisture-laden atmosphere, is necessarily in a degree artificial and may be regarded as a notable triumph of modern horticulture.

Cultivation and irrigation are closely related to each other. In order to achieve the best results water should be applied in sufficient but not excessive amounts, and deep irrigation as well as cultivation will keep the feeding roots as low as possible. The depth of cultivation should vary from year to year. Such variation in cultivation puts an end to much of the outcry against "hardpan" which frequently is not "hardpan" at all, but only the well known "plow sole" which comes from plowing to the same depth each time, with the added aggravation of shallow irrigation. Experience shows that the best results with irrigation are obtained where water is slowly run in deep furrows, and the greater part of the surface is kept dry and deeply cultivated. with this method a team can be driven along the dry strips of land between the furrows, and with a harrow or other appliance the dry soil can be dragged into the furrows to lessen the evaporation immediately after the irrigation water is turned off. With any other system, it is necessary to wait twelve hours or longer before a team can be driven over the ground.

The cost of installing a sub-irrigation system places it beyond the reach of the ordinary small grower, but it is the ideal way to apply water and greatly lessens waste. However,

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Control of Large Plant Bugs

By J. R. Watson

There are a number of large plant-bugs which attack almost any succulent plant and at times become very annoying pests. On citrus they inflict two kinds of injury. They suck the sap from the young and tender twigs, often causing them to wilt and finally die. It is only on young trees that this type of injury is worthy of attention. A habit fraught with much more danger to the financial interests of the grower is that of attacking the ripening fruit in the fall. From this the bugs sometimes extract so much juice that the fruit drops. Sometimes as much as half of the crop is lost in this manner. Even if the fruit clings to the tree the punctures made by the bugs give to fungi and other organisms that cause decay an avenue of entry into the fruit. Naturally those varieties of citrus that have thin skins suffer most. Tangerines, including satsumas, are the first choice of the bugs, and oranges second. Grapefruit is not much troubled.

Green Soldier or Pumpkin Bug

The pumpkin bug or green soldier is by far the most common and destructive of the large plant-bugs. It breeds particularly on such legumes as cowpeas and beggar-weed and when these are grown as a summer cover crop in the groves and allowed to stand too long, the bugs may attack the fruit. The color of this bug is usually bright green, but some of the bugs, especially hibernating ones, are dark olive-green or pinkish in color. The females are a little more than a half inch long and slightly more than half as wide, being broadly oval in outline. The males are a little shorter and considerably narrower, on the average.

The young are quite different in appearance from the adults. They are bluish, with some red markings, and are more nearly circular in outline. Like all members of the "stink bug" family, to which they belong, pumpkin bugs give off a strong, disagreeable odor.

Life History

The eggs of the pumpkin bug are laid in clusters on the food plant. They hatch in about a week. The young feed together in groups or colonies for some time after hatching. They probably require about two months to complete their growth, molting four times. With a fifth molt they become adult with wings and reproductive organs fully developed. The adults live for several weeks; the last generation in the fall lives for several months. No breeding takes place during the winter, at least in most of the state. At Gainesville hibernation is only partial. Although many may be found under the bark of logs, in Spanish moss and other sheltered places where they apparently remain until the return of warm weather, others, in constantly decreasing numbers, remain on juicy plants and are more or less active and feed all winter. They are abundant in October, plentiful in November, common in December, but rather scarce in January and February. In March and April they again become more common, due to many bugs coming out of hibernation. In April and May young appear.

In spite of the bad smell birds occasionally eat these bugs. They are also attacked by other bugs, one of the most important of which is Euthrynchus floridensis. Probably the most efficient check on their increase are tachinid flies whose larvae live as parasites inside of the bugs.

Control

Because of their large size no spray safe to use on citrus trees will kill the adults. The larvae may be killed by the oil emulsions, soap, or tobacco solutions. It may be found economical to collect the adults from the fruit. For this purpose large nets at least three feet in diameter and of equal depth should be made. Muslin is a good material from which to make this net. Each net should have a short handle which, if extended across the diameter to stiffen the opposite rim, will permit the use of telephone wire to complete the skeleton for the net. Bend the wire into a hoop and nail the loose ends to a wooden handle.

One man can manipulate this net, but two may work to better advantage. One places the net under a limb of fruit and the other gives the branch a quick, vigorous shake, which causes the bugs to roll into the bottom of the net. After the men have finished a tree the bottom of the net is dipped in a bucket containing kerosene. This keeps the net constantly wet with kerosene.

For large trees not too close together and with few limbs touching the ground to prevent a ready manipulation, the nets should be larger. The writer has used some nets six by twelve feet. These were suspended from a light wooden frame like those used for holding quilts or stretching curtains, the net sagging two or three feet in the center. The net should be of closely woven canvass so that insecticide oil, crude oil or kerosene can be placed in the bottom, into which the bugs will fall. Cotton waste placed in the net will absorb the oil and in rolling round will thoroughly wet the bugs. Two men will be required to manipulate the net and at least another to shake the branches.

For large trees these nets will be found more economical than the smaller ones strung on telephone wire. They are effective, however, only at a temperature below 70 degrees. Above that the bugs will take to wing as they drop, before they strike the canvas. The use of the large nets is therefore restricted to the very early morning, to moonlight nights and to cold days. The smaller nets can be used all day, the more effectively in the early morning.

If the bugs are not thoroughly saturated with the oil chickens will eat them. They are probably worth at least five cents a pound as chicken feed. Chickens turned into a grove will eat many of the bugs if other insect food is not too abundant. Chickens cannot, of course, reach those high in the trees, but the majority of the bugs usually collect on the lower branches. Or, better, the chickens can be turned into the grove while the bugs are still on the cover crop.

Prevention

If proper precautions are taken these bugs will seldom get on the fruit. Their attacks are usually brought on by allowing the cover crop of cowpeas, beggar-weed or velvet beans to remain on the ground too long, or by the lack of sufficient thoroughness in cutting (as by leaving uncut patches between the trees) or by using the wrong method in cutting. The cover crop should be cut by the middle of September. The man with the scythe should precede rather than follow the mowing machine; that is, the spaces about and between the trees in the rows should be cut

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NATIONAL ORGANIZATION

THE CITRUS INDUSTRY firmly believes that there should be a national organization of citrus men. And when we speak of a national organization, we do not mean an organization of growers, or of packers, or of shippers, or of distributors. We mean a national organization which shall embrace every phase of the industry and every section in which citrus is grown, packed or distributed.

Both Florida and California have their co-operative organizations of growers. The same is true to some extent of the satsuma growers. There are in both California and Florida closely allied organizations among non-exchange growers, packers and distributors. All of these organizations serve a purpose in a certain way, but none of them go far enough to obtain for the industry the best results which might be attained by a closely-knit national organization.

There has been entirely too much jealousy between different sections and different interests, and too little real co-operation. California has "knocked" Florida and Florida in turn "knocked" the California product. Both have united to belittle the attempts of Arizona and Texas to enter the citrus field, and neither has taken due account of the accomplishments of the satsuma belt.

Then, there has been jealousy between different groups of citrus men. Growers have been suspicious of packers and packers have been inclined to look askance upon the distributors. Instead of working together for the best interests of the entire industry, there has been too much inclination to "watch the other fellow." Time which might much better have been devoted to boosting the industry has been wasted in trying to "down" someone else. There should be a cessation of this spirit—a get-together movement which shall embrace every section and every interest. The industry is big enough and important enough to present a united front.

Everyone knows of the success of the grain men's, the produce men's, the rice men's and the millers' associations, and the success of many national advertising campaigns which have been carried on through the efforts of national organizations of one sort or another.

Just at this time there are vital questions affecting the industry which should have the united support of every citrus interest in the solving. One of these is the transportation problem. There should be a national organization prepared at all times to act on any phase of this problem which may present itself—an organization big enough and broad enough to view the question from the standpoint of the good of the industry as a whole and not from the narrow viewpoint of any one neighborhood or section. It should be possible when any transportation problem arises for such an organization to act at once, without waiting for numerous small organizations to get together or for individual buyers and shippers to join the movement. Often the fight is lost before the affected interests can be gotten together.

Then there is the question of legislation. Many times citrus men are confronted with the threat of unfavorable legislation at the hands of congress. The word goes out and some one or two organizations get representatives on the ground. But it is understood that these men represent, not the entire industry, but a small fraction of it. Their pleas may be successful, but more often they fail by reason of lack of concerted effort on the part of all citrus men. With one strong national organization representing all interests of the industry, national legislators would be more inclined to "sit up and take notice" when the organization through its representatives spoke. Instead of a few individuals or some organization representing a few hundred or a few thousand individuals, there should be one organization representing all citrus men.

National advertising campaigns have been carried on by some of the growers' organizations and to some extent by independent distributors. A vast amount of good has been accomplished by these campaigns, and much more will be accomplished. But, granting this, there is still room for a greater advertising campaign. One which will advertise not merely the brand of some organization or packer, not the product of one state or of one section in a state, but which will have as its aim the increased consumption of all citrus fruits, whether it is grown in California or Arizona, Florida or Texas. Every national advertising campaign benefits all growers and distributors. All should help bear the expense.

Disease control is another phase which could and should be fostered by a national organization, and there is hardly a month passes by that some question of almost vital interest to some branch of the industry does not arise which could be much better met through a strong national organization than through the efforts of individuals or small sectional organizations formed primarily for an entirely different purpose.

That the present citrus organizations, whether co-operative or independent, whether of grower or packer or distributor, are of vast benefit to the interests affected, there can be no doubt. They are much to be desired and should be continued by all means. But they stop short of the great purpose for which a national organization is needed. At the very best, they are purely local or sectional in membership and they fail to carry the weight with legislators and in commercial and traffic circles that a national federation would carry.

Among the leaders in the numerous organizations now in operation in the different fields and different branches of the industry, there are many strong and able men, and it is to these men that we must look to take the lead in lifting the industry out of its present state of sectional jealousy and weakness into a state of national breadth and greatness.

Every man who ever grew or packed or aided in the distribution of a box of citrus fruit, whether he lives in Florida or California, in Arizona or Texas, or whether he grows a few boxes of satsumas in Mississippi or Alabama, is interested in the formation of a national feaderation of citrus men which shall embrace not only the

growers and packers, but the distributors as well. The grower cannot hope to prosper unless the packer prospers, nor can the packer build up a bank account if the distributor is operating at a loss. What is needed is some leader farsighted enough and efficient enough to bring all of these interests together into one strong organization which shall have as its sole aim and purpose the greatest good of the industry as a whole—for in the final analysis it will be found that what is best for the industry as a whole will be best for the individual grower, packer or distributor, and that each must work in harmony with the other.

THE FARMER IN A NEW ROLE

A NEW power has arisen!

It is the American farmer!

And when we say farmer, we mean not only the man who produces wheat and corn, cotton and rice, sugarcane and tobacco, but also the man who by his toil and his intelligence produces those finer articles which go into the make-up of the daily article of diet of the American home—the fruit grower and the orchardist.

Time was when the world looked upon the farmer as a being separate and apart from the well ordered and regulated life of the country at large, a being to be ignored or scorned or pitied as the case might be, but in any event not to be considered in the general summing up of life as it was lived in the Great American Home.

True, when a load of wood was needed for the minister or a fat pig for a poor widow, the farmer was called upon to make his contribution—and was promptly forgotten until the need arose for again replenishing some scanty larder.

True, too, the politician took cognizance of the "farmer vote" and made his bid with a view to capturing it en masse. But the bid was based upon prejudice and little or no thought was given to the farmer as a thinking man who saw through the thinly veiled bait of the wily politician. And therein the politician erred. When he awoke to his error, he found that the "farmer vote" had concentrated upon the candidate who had the judgment to appeal to the farmer's interest rather than to his prejudice.

But those were the old days.

Now the farmer is a power in the land.

His voice and his influence and his vote are sought as avidly as the voice, the influence or the vote of the banker or the lawyer. Indeed, more avidly, for it has come to be recognized that the farmer has come, or is fast coming, into his own.

In days gone by we spent our public funds for everything imaginable save to aid the farmer. We had class legislation for every class save the farmer. The farmer we left to look after himself.

But now, federal, state and county agents are provided to aid the farmer in the solution of his problems. Federal farm loan banks have been created to help with his financial problems. Nation, states and counties recognize in the farmer the bulwark of their material greatness.

Never before in the history of the world has the realization of humanity's utter dependence upon the agriculturist been so acute as it is today. The situation of civilization will be determned as the farmer may succeed in providing food. And it is not alone in providing eatables that the farmer is important. He is the bulwark of governments and of peace and order.

The farmers, and among farmers no class is more important or more to be reckoned with than the fruit growers, are recognized as deserving of every aid and encouragement which administrative bodies can give, and every state which hopes to achieve the greatest possibilities is expending or preparing to expend every ounce of available energy in the promotion of agriculture.

The world needs not only every man now engaged in agriculture, but it needs, and for many years to come will need, ever increasing numbers to provide the necessary food to maintain the increasing populations. Whatever may be in store for other classes and other lines of business under the readjustments which may be necessary as an after-the-war corrective, the farmer, be he agriculturist or horticulturist, has his house built upon the most firm and lasting foundation. He will be the last to feel the pinch of readjustment, for the world needs the farmer and his wares.

The wise grove planter will secure his nursery stock early.

Watch the young trees. It is cheaper to keep them healthy than to replace them at the present cost of nursery stock, to say nothing of the element of time saving in bringing them into bearing.

Those Texas grove men have the "faith of their convictions." The only limit to their plantings is their ability to secure proper nursery stock.

The satsuma growers are looking forward to a good crop and a profitable season.

The best way to rid your grove of "pumpkin" bugs is to "pick" them.

Practically every shipper of citrus fruit from Florida reports a largely increased business during the season just closed.

While the crop of the present season is not expected to be anywhere near as heavy as last, the increased acreage in bearing will doubtless help to bring the total shipments well up to last year's heavy record.

Fertilization, cultivation and spraying, coupled with "eternal vigilance," hard work and intelligence, is the price the grower must pay for success.

Increased freight rates mean smaller profits for the citrus growers. Swat the rate increase!

Every time the freight rates are increased in the interest of "greater efficiency," the shipper begins to look for poorer service.

Good citrus lands will never be worth less than they are today. The wise buyer recognizes this and is making his purchases against future needs.

Great Increase in Fruit Shipments

An evidence of the great increase in citrus fruit shipments from Florida during the past season is seen in the report of Salesmanager George A. Scott at a recent meeting of the directors of the Florida Citrus Exchange.

According to this report the Exchange, which handles the product of some four thousand growers of the state, showed a gain of sixty-eight per cent over the shipments of the preceding year. This, too, in spite of the fact that the previous year's business had shown a very healthy increase over previous years.

Mr. Scott pointed out that while the heavy increase in shipments was due in a large extent to the heavily increased yield of Florida trees, that a great part of the increase must be attributed to the steady growth in membership and acreage within the Exchange.

The total shipments handled through the various sub-exchanges during the year just closed, aggregated in excess of 3,675,000, a net gain of 1,570,000 boxes over the season of 1918-1919. In spite of the heavy increase in the amount of fruit handled, Mr. Scott pointed out that the work had been handled with practically no increase in the working force of the Tampa headquarters of the sales force in the Northern market centers.

The showing made by the Exchange in the handling of this largely increased amount of fruit was very gratifying to the officers and directors present at the meeting.

Following the meeting of the Exchange proper, a meeting of the directors of the Exchange Supply company was held, at which steps were taken for greatly enlarging the capital and expanding the business of this subsidiary organization of the Exchange.

Increasing the capital stock of the company to $1,000,000 and allowing a maximum indebtedness of $1,500,000, the stockholders of the Exchange Supply company at a special meeting provided the means for largely expanding the activities of this purchasing organization of the growers. More than 90 per cent of the outstanding capital stock was represented at the meeting, and the vote was unanimous.

The rapidly growing volume of business being transacted by this affiliated company of the exchange, together with the necessity for further provision for timber supplies for future orange box requirements made this action wise in the opinion of the directors. It is now anticipated that the field of the company's operations may be expanded adequately to meet the needs of the growers.

At the meeting of the company's directors preceding the stockholders' meeting Manager W. F. Miller reported business for May at $156,000 and that for June at $175,000, or a total of $331,000 for the two months as against a total of $75,000 for the corresponding two months of last year.

Mr. Miller also reported that earned refunds for these two months were something in excess of $30,000. Necessary resolutions providing for carrying forward the work of absorbing the Growers Land and Livestock company were adopted at the directors' meeting, also; and these arrangements shortly will be carried through.

EXCHANGE SUPPLY COMPANY MAKES BIG PURCHASE

One of the biggest transactions in citrus circles ever made in Florida and one of the biggest business deals in the state in recent years has just come to light in the formal announcement that the Exchange Supply Company, an auxiliary organization of the Florida Citrus Exchange, has purchased the Warnell Lumber and Veneer Company, a big concern having headquarters at Plant City.

The deal involves title to property said to be valued at upwards of one million dollars, and includes the purchase by the Exchange Supply Company of the outstanding stock of the Warnell company. The property included in the deal comprises the big veneer and crate mill at Plant City, together with numerous mill buildings, warehouses, lands, lots and other buildings. The company's saw mill at Fort Green also is included in the purchase, as well as the privately owned Warnell logging road with four locomotives and full equipment, some forty head of mules and a great deal of miscellaneous equipment.

Manager W. F. Miller of the Exchange Supply Company estimates that the Warnell plant, together with the mill of the Exchange Supply Company now in operation at Ross in Hillsborough county and the mills of the Polk County Sub-Exchange at Lake Wales and Avon Park, will give this purchasing organization of the growers facilities for the manufacture of every orange and grapefruit box required for the four thousand or more members of the Florida Citrus Exchange who are served by the Exchange Supply Company. He further estimates that the timber holdings acquired through this purchase, when added to the former holdings of the Exchange Supply Company, and with the addition of another large tract which is now under option, will provide a timber supply sufficient for the box requirements of the Florida Citrus Exchange for a period of approximately twenty-five years.

The Exchange Supply Company has enjoyed a rapid and very substantial growth since its modest inception a little more than three years ago, and is now a big factor in the Florida business world. This latest transaction will go far toward placing it in the forefront of South Florida business institutions.

The Exchange Supply Company is owned by the various local associations of the Florida Citrus Exchange, and its transactions are confined to members of that organization. Its publicly announced purpose is to "make the citrus growers, who necessarily are wholesale sellers, wholesale buyers as well."

In its first year the company did a business in excess of $200,000. Its second year showed a business of more than $600,000, while that for the third year, which closed on April 30, 1920, was in excess of $1,600,000. The current year's business, it is estimated by the management, will approximate $3,000,000, even without the additional volume to be gained through the acquisition of the Warnell properties.

The directors of the Exchange Supply Company are: J. H. Ross, president, Winter Haven; D. C. Gillett, vice-president, Tampa; C. E. Stewart, Jr., secretary and treasurer, Tampa; P. C. Peters, Winter Garden; A. F. Wyman, Manatee; W. W. Birchfield, St. Petersburg; J. W. Sample, Haines City; C. H. Walker, Bartow; A. G. Hamlin, DeLand; W. F. Miller of Tampa, who has managed the company since its organization.

Proper Planting of Citrus Trees

By F. J. Dahlken

That citrus culture is one of the great and growing industries of Florida can no longer be questioned, as thousands of carloads, amounting to many millions of dollars, are shipped annually. Citrus trees are either dug with a ball of earth varying in weight from 5 to 40 pounds, or they are taken up with naked roots. The former method is usually followed in handling trees in Florida. Freight charges on stock handled in this manner are heavy, still the satisfaction of knowing that with ordinary care every tree will grow, offsets the slight additional expense incurred in transportation charges.

Trees shipped in this manner may be kept in sheds for several months before planting by merely watering the ball of earth occasionally. In taking up trees with the naked roots exposed great care should be given so as not to expose the roots to the sun and wind for any great length of time. In planting set the trees so that when the soil is settled the union of the bud with the stock should be not less than two to four inches above the ground. Be sure to settle the trees with water, whether planted with naked roots or balled.

In filling in the hole around a balled tree, never tramp on the top of the ball, as it will break it, dislodge the fiberous roots and in many instances cause it to die. After the hole in which a balled tree is planted is partially filled, cut the cords by which the burlap is tied to the tree; the burlap need not be removed, as it will soon rot.

Budded trees should not be planted closer than 22 to 24 feet apart on the square method. In most cases lately we find it to an advantage of great importance to plant the trees 30x30, in this way preventing the trees, by trimming and heading, from growing too high and making them spread over a larger area of ground, making it easier to pick the fruit, also a great saving in spray materials. This system is followed religiously in California, causing the great success of fruit in that state.

Citrus trees being an evergreen, they can be planted at all seasons of the year, although the months of March, April, May and June are considered the most favorable. In the interior, where it is extremely hot during the summer months, it is advisable to plant as early as possible in the spring, although planting should not begin until the ground is fairly warm, so that the trees will immediately begin to grow. Trees planted too early will remain in a dormant condition until the ground is sufficiently warm and cause the decay of the fine fiberous roots and when the trees do start they will have a very slow growth until new roots are formed, for this reason it is advisable to defer the planting until the ground is more favorable.

When planting cannot be done in the spring it is advisable to plant in July or August, preferably to waiting until the following spring, although the trees do not make such vigorous growth, they have a good footing to start in with the following spring.

The only thing necessary in successful summer planting, is to see that the trees are properly handled from the nursery to the orchard and are sufficiently watered in planting, and shorten back the branches to within about six inches of the main body.

Trees headed at four feet or more should be headed back to about 28 inches for the purpose of making a new head. It is also advisable to wrap the main body of the young trees with burlap, paper or tubes as a preventive from sunburn and the growth of suckers. The same planting guide is applied to the pomelo, or grapefruit, as it is commonly called. The pomelo is really an improved shaddock, which for itself is of a family of non-edible fruits, the grapefruit being of an improved variety and is much sought after for its medicinal qualities and as a healthful breakfast fruit.

PETERS GROVE AGAIN CHANGES OWNERSHIP

Messrs. Z. Russ and H. L. Hollingsworth, of Brownville, are destined to become famous for their large grove holdings in DeSoto county, if they continue the practice of buying every grove which they find for sale at a reasonable price. This is evidenced by their most recent purchase, when they closed a deal for the Peters grove, located one and one-half miles west of Brownville. This grove was recently purchased by Carey Carlton and Clarence Carlton.

There are 379 acres in this tract of land, with fifty acres in big fruit trees having reached the bearing age, and some of them well advanced in years. This property is valued at $60,000 and is one of the best pieces of grove property in DeSoto county.

It will be remembered by many that Messrs. Hollingsworth and Russ, during the month of October, bought large groves in this same locality, consisting of the C. C. Pearce grove, twenty acres, and the A. J. Batterton grove, consisting of fifteen acres. Besides the above listed property they are the owners of fine groves about their homes in Brownville, giving the possession of not less than 150 acres of bearing fruit trees in and around Brownville locality. All of this property is adjoining which again adds to its value.

On the 150 acres there are 10,000 trees, which during normal times, will bear approximately 50,000 boxes of citrus fruit. These men now rank among the largest grove owners in the largest citrus belt in the United States.

The experience of last summer is still fresh in the minds of California valencia shippers, when the heavy eastern movement of grapes greatly aggravated a car shortage which already was most serious. Despite desperate efforts on the part of Californians to get better service from the railroads in the matter of equipment, there seems now a fair chance of a repetition of last summer's experience, and that considerable valencias must be held back because of it.

"A FINE LITTLE PAPER"

The Citrus Industry,
Tampa, Fla.

The May issue of The Citrus Industry is the first I have seen. It is a fine little paper. Enclosed is $1.00 for a year's subscription. If you have a half dozen extra copies of your last issue please mail them to me as I desire to send them to friends.

W. C. Daniells.
Tavares, Fla.

Orange Vinegar by Rapid Process

By E. M. Chace and H. D. Poore

Several months ago this laboratory sent out, through the office of information of the United States department of agriculture, information on the manufacture of orange vinegar by the "roller process." As stated at the time, this method is proposed for the production of vinegar by the grower in small quantities for home use and local consumption. Since the press notice was issued, work has been completed on the rapid process method for making vinegar from orange juice. While the roller process produces only from 30 to 40 gallons per generator and requires from 60 to 90 days to complete product, the rapid generators have capacities ranging from 30 to 150 gallons every 24 hours.

The Rapid Generator

The smallest size generators consist of upright fir tanks 6 feet high by 3 feet in diameter, bound by painted iron hoops fitted with draw lugs. These tanks have three compartments: the upper one contains the distributing system; the center, the beechwood shavings; and the third, the finished product.

The distributing system consists of a trough divided lengthwise into two compartments and so hinged to its base as to dump when either compartment becomes filled with cider. This trough is so arranged that when it dumps, the empty side comes under the feed pipe and is filled in turn. Thus the fermented juice is thrown first on one side of the generator, then on the other. Under the trough, fitted tightly into the sides of the generator, is placed a perforated heading, which assists in distributing the juice evenly as it enters the middle compartment.

The middle or generating compartment, which is four feet high, is loosely filled with beechwood shavings. At the bottom of this compartment is placed another perforated head, through which the finished product trickles into the third or collecting compartment. About midway between the two perforated heads is an aperture for a thermometer, which should extend to the center of the compartment.

Just below the lower of the perforated heads are six one-inch holes, slanting downward through the wall of the generator. Six pegs, made so that they can be tightly fitted into these holes and each with a ¼-inch hole bored lengthwise through the center, are furnished. These holes are also provided with tightly fitting but solid pegs. This scheme makes it possible to regulate the volume of air passing through the apparatus. The third compartment is provided with a spigot for drawing off the vinegar.

The larger generators are similar to the small ones, differing only in minor details, such as having two thermometers, one near the top, the other at the bottom of the generating compartment. Some generators are provided also with two sets of air holes, the second row being about midway of the apparatus.

The Process—Preparation of the Orange Cider

The preparation of the orange juice for the generator is identical with that required for the roller process. The juice may be extracted from the fruit by means of a continuous or hydraulic press and strained through bronze gauze. It is then ready for the alcoholic fermentation. For this part of the process it is best to procure a pure yeast culture, although brewers' or bakers' yeast answers the purpose very well.

To prepare the first batch, heat a gallon of the juice to boiling and cool to about 85° F. Mix the yeast thoroughly with this juice, and keep it in a warm place until the fermentation has ceased. When the main lot of fruit has been pressed and the juice strained, run it into the fermentation vat and mix the yeast preparation with it. The fermentation vat should be placed where the temperature will be as even as possible and preferably about 85° F.

Where the quantities are small and the temperature right, the fermentation will be completed in two or three days, but in larger lots or with lower temperature a longer time is required. Never fill the vat more than two-thirds full, as loss may be sustained through foaming. Keep it covered at all times to prevent flies and dirt from contaminating the product.

When the foaming has ceased, indicating that the fermentation is over, make the generator ready. It is best to filter the cider. While this step may not be necessary, it pays, as it removes small particles of fruit and extraneous matter which enter the generator, causing it to become foul. The cleaner the generator, the better it will operate, and the longer it will last without renewal. Some operators making apple vinegar place a layer of clean straw under the upper perforated head on top of the shavings. This layer acts as a filter and is replaced when foul. Corn cobs can be substituted for beechwood shavings, and coke has also been tried out as a substitute. The latter is more or less of an experiment, but is said to answer the purpose in a satisfactory manner, and has the advantage of lasting much longer.

Operation of the Generator

After the generator has been cleaned and filled with clean shavings, saturate the shavings with vinegar by repeatedly passing through the generator a good grade of cider vinegar, pouring back the liquid that flows out at the bottom. Be sure that the vinegar used has not been pasteurized, as the object of this operation is to seed the generator with living spores of the acetic bacteria.

When the generator is ready, start the flow of orange cider into the distributing trough, regulating it so that at first the trough will dump about every twenty minutes. Open all the ventilating holes, watch the thermometer carefully, and as soon as the temperature approaches 86° F., begin replacing the large pegs in the holes. If the temperature rises above 90° F., replace some of the small pegs in the holes in the large pegs and by manipulating the pegs, keep the temperature as near 86° F. as possible. Removal of the pegs allows the entrance of more air into the generator, hastens the action of the bacteria, and thus raises the temperature. Closing the holes with the pegs has the opposite effect.

If large generators are being operated, the cider may be converted into vinegar by one passage through the apparatus. With smaller sizes, it is customary to run the partly finished product through a second generator, or to mix it with fresh cider about to enter the generator. Some operators mix the cider entering the apparatus with vinegar in the proportion of two volumes of the fresh cider to one of vinegar. This mixture will produce finished vinegar on one pas-

sage through the generator.

Place the vinegar generator where an even temperature can be maintained, an outside temperature somewhat below that of the optimum operating temperature of the apparatus is best. Take great care to keep the surroundings clean, leaving no scraps of fruit, cider, or vinegar drippings about. It is a good plan also to set the vats sufficiently far above the floor so that the space below them can be kept clean. Keep the generators covered and when the pegs are not in place, lightly cover the holes with cotton or gauze to prevent the flies from entering.

The Generator in Action

To give some idea of the generator in action, the following log of runs, made under favorable and adverse conditions is given:

Lot 2 consisted of 2500 pounds of cull oranges, which on pressing yielded 80 gallons of juice, or 64 gallons per ton. The yeast mixture was prepared as described above and placed in the juice on Aug. 10. The fermentation was completed on Aug. 14, the sugar having fallen from 10.67 grams per 100 cc. to a mere trace, and the alcohol having risen from 0 to 6.12 per cent, by volume. The temperature in the fermentation room ranged from 70° to 90° F.

On Aug. 14, at 11 a. m., the cider was started through the generator at a temperature of 76° F. At 4 p. m. there was no change in temperature, although all the pegs had been removed. At 9 a. m., Aug. 15, however, the temperature had gone up to 100°, the room temperature rising to 90° during the day. All the pegs were replaced without effect, owing largely to high temperature of the air. On Aug. 16, at 9 a. m., when the thermometer registered 102°, all the air was shut off and the flow of cider increased until the temperature had dropped to 88°. On the morning of Aug. 17, the thermometer again registered high, 104°, and the same tactics were adopted to reduce it. There being no way to regulate the air flow at night, high temperature prevailed in the generator until Aug. 19, when all the juice was put through a second time, the cider not having been fully converted on the first run. On Aug. 21, or 178 hours after the start, the batch was finished, the alcohol content having dropped to 0.43 per cent. The generator working under poor conditions had required over 7 days to convert the 80 gallons, with a marked loss in the product.

On lot 4 the apparatus was working under more satisfactory conditions, and the product was finished in 29 hours. On the first day, 6 quarts of orange juice, containing 10 cakes of compressed yeast, which had been fermenting for 48 hours, were added to 35 gallons of juice. This juice had been obtained by pressing 1600 pounds of badly frosted fruit, the yield being at the rate of 44 gallons per ton. Two days later the fermentation was complete, the sugar in the juice having dropped from 9.87 grams per 100 cc. to a trace, and the alcohol having risen to 5.75 per cent by volume. The generator had been idle but 24 hours, so that it was primed with vinegar from the last lot. As the room temperature was 54° F. at the start, about 15 gallons of the cider were heated to 95° and the generator started with this material. All pegs were out at the start and the generator temperature was 82° at 11 a. m., when the first cider was run in. The temperature gradually increased until at 8 p. m. it was 94°, by which time all the pegs had been replaced, and at midnight the thermometer registered 86°. At 3 a. m. it had fallen to 80°, and the pegs were all removed. By 6 a. m. it had returned to normal, and remained between 86° and 88° until 4 p. m., when the last of the lot had passed through.

Figure 2 shows graphically the action which takes place under proper and improper working of the apparatus. The vertical lines indicate the percentage of total acid in the cider as it is being converted to vinegar, while the horizontal lines represent the hours which the generator has been operating. The high acid content noted at the start of lots 4 and 5 is due to the fact that the generator had been working on other lots of material, and that the apparatus was left with some residual vinegar in it, so that priming would be unnecessary. Thus the first cider passing through was mixed with vinegar from the previous lot.

Preparation for Marketing

The finished product is usually stored in closed vats until ready for barreling or bottling. It is best to sterilize and filter the orange vinegar before bottling it. This operation costs but little, does not injure the quality and does improve the appearance. Before bottling, the vinegar should be stored in wood for some time to improve the color and flavor. Neither will change after it has been bottled. Apparatus for sterilizing and filtering is a good investment, as it soon pays for itself in increased returns, if much vinegar is to be made. The sterilized product will keep much better after the bottle is opened and does not cloud up nearly as soon as the raw product under similar conditions.

Quality of the Product

Samples of orange vinegar made at the Citrus By-Products Laboratory in barrel lots, submitted to jobbers who make a business of handling vinegar, have been pronounced as fine as the best grade of their product. Great care must be used in making and handling it, and every effort made to see that it establishes and maintains its excellent reputation for quality.

When carefully made, orange vinegar usually exceeds the standard for total acidity required by the official standards for cider vinegar. It does not always contain the amount of volatile acid which is standard for apple cider vinegar, owing to the fact that apple juice contains somewhat more sugar than orange juice. The non-volatile acid of orange juice remains in the product and increases the total acidity of the orange vinegar. The non-volatile acid of apple juice has little effect upon the vinegar made from it.

Equipment for a Vinegar Plant

It is impossible, of course, to figure accurately the cost of installing a plant when prices are changing as they are at the present time. The best that can be done is to indicate what will be needed, and give the cost of this apparatus at the time of writing (Jan. 1, 1920).

If the fruit has not been peeled in order to make use of the peel, it should be passed through a shredding or crushing device, several satisfactory types of which can be obtained from apple vinegar supply houses. Prices for these range from $75 to $160. If a continuous press is used, the crushing device is usually made a part of the press and can be included in its cost.

A continuous press, with a capacity of 5 tons for a 10-hour day, costs about $3,000, exclusive of the motor or engine to operate it. In the long run these presses are the most economical, for they require little attention while in operation, and effect a great saving in labor. There is little to choose between them and the hydraulic press when yield is considered. A small hand power hydraulic, which may be made to produce from 200 to 250 gallons per day, can be obtained for about $300, including a single set of racks and

(Continued on Page 17)

Sees Peril to U. S. in the Exodus to Cities

About ten years ago Guglielmo Ferrero, the Italian historian, came to America. He came, he said, with a purpose that sounded like a paradox.

"It is my belief," he told his lecture audiences, "that a journey in the new world is of supreme benefit intellectually to a historian of the ancient world, and that, in order to understand the life and history of Greek and Roman society, it is just as important to visit the countries of America as Asia Minor or Northern Africa."

Before coming here Ferrero had completed a monumental work, "The Greatness and Decline of Rome," in which he demonstrated that the decline and the fall of that ancient civilization was brought about not by military or political causes, but by the slow growth of a cancerous disease that infected the body politic and gradually undermined its vitality.

Urbanization a Disease

The malady from which the greatest empire of the world died was excessive urbanization—the growth of the cities at the expense of the productive areas of the country. Little by little, through the centuries, the greatest loadstones of the Roman cities, with their advancing prices and swelling luxuries, overbalancing the producing power of the country, had sapped the vital energies of the nation and re-precipitated into chaos the most brilliant and prosperous civilization the ancient world had known.

Leaving our shores after a close and sympathetic study he was deeply impressed with two great outstanding facts that contained elements of alarm—the rise in the cost of living and the luxury and the growing allurements of the big cities. He reached the conclusion that history was again repeating itself and that the germs of the disease of urbanism that killed Rome were rapidly increasing and multiplying in the American commonwealth. The reign of extravagance, the increased cost of living, the growing preference for city rather than country life—even ten years ago Ferrero saw the menace of these symptoms of the hidden disease. On his return to Europe he wrote a book—"Ancient Rome and Modern America" (Putnam's Sons)—to prove that America is fast entering into the maelstrom of urbanization—in imminent peril of treading the same paths that led to the downfall of the ancient empire.

Theory Being Proved?

Ten years ago Ferrero's theory was regarded as rather fanciful. But today, with prices soaring far beyond the basis from which he theorized and with another census daily flashing forth alarming confirmations of his urbanization deductions in the enormous growths of the cities and the decline of the rural populations, the warnings of the Italian historian are beginning to command a more sober attention. Are we really riding to a Roman fall? Ferrero says we are, but he is no pessimistic philosopher. He does not say that the fate of ancient Rome is to be ours. There are resemblances, but there are also differences—there are leavens that may save us whole. He makes no prophecies—he merely states the facts as he sees them and sounds a friendly warning. Here's the way he makes out his case:

"Is it permissible to talk of decadence at the very moment when man has made himself lord of the whole earth and is even learning to fly? History cannot show a richer, wiser, more powerful, more daring epoch than the present one. No wonder that most people resent the suggestion that we, in the flush of our brilliant successes, are seeing the repetition of that ancient and terrible history of the last centuries of the Roman empire.

"The disease which killed the Roman empire was in fact excessive urbanization.

Era of Increased Wealth

"After two centuries of war, an epoch of rapid increase of wealth, of lucky enterprises, of frequent, close and varied commercial and intellectual intercourse between the most distant peoples began. In every part of the empire new industries and agricultural enterprises gave rise to a prosperous middle class and to provincial aristocracies, which gradually came to form the governing classes of the empire, migrated to the cties, strove to enlarge them, to embellish them, and to make them more comfortable, reproducing in every part of the empire the splendor of the urban civilization as perfected by the practical Roman spirit of organization.

"The empire covered itself with cities great and small, rivaling each other in splendor and wealth; and into these cities, at the expense of depopulating the countryside, where nobody was willing any longer to live, it attracted the peasantry, the village artisans and the yeomanry. In these cities schools were opened in which the youth of the middle class were taught eloquence, literature and philosophy and trained for official posts, the number of which increased from generation to generation, and for the liberal professions. * * * With each succeeding generation, the impulse towards the cities became stronger. The numbers and the requirements of the modern population increased.

"In order to feed, amuse and clothe crowded city populations; to carry through the construction of magnificent monuments whose ruins we still admire; to provide work for the industries and arts of the cities, agriculture was, little by little, ground down by everlasting burdens. The position of the peasant, in the solitude of the depopulated countryside, became ever more sad and gloomy just as the cities became fairer, bigger, fuller of amusements and festivals.

A City of Idlers

"And one day the empire awoke to find that its cities were swarming with beggars, idlers, vagabonds, masons, plasterers, sculptors, painters, dancers, actors, singers—in short, the whole tribe of the artisans of pleasure and luxury. But in the fields, which were expected to feed all these men who had crowded into the cities to work or to idle, there was a dearth of peasants to cultivate the land. While the cities tricked themselves out with magnificent monuments, the empire was threatened with a dearth of bread—and of soldiers. The agriculture of the empire, and with it the empire itself, received its death blow.

"Today, Europe and America resound from one end to another with a chorus of complaints from men and women who have to live in the cities. Rent, bread, milk, meat, vegetables, eggs, clothes— everything, in short, is rising in price. Governments are besieged with entreaties, threats and prayers to provide supplies, but they do not know how to do so. What is the cause, what the remedy, of this strange phenomenon?

"In no country is this phenomenon more apparent and interesting than in the United States. It is a veritable recommencement de l'histoire, and the study of the Roman empire can be of the greatest service

in helping us to understand it. It is the first serious, universally felt symptom of that excessive urbanization which was the ruin of ancient Rome.

"This modern society arises from the overdevelopment of the cities, from the too rapid increase in the needs and luxuries of the multitudes who live in the cities. Men and women concentrate in the cities and swell the urban industries and luxury, public and private, intent on putting into operation all the marvels which the fertile modern genius is continually inventing. The countryside, on the other hand, in the last half century has been left too much to itself, and agriculture has been too much neglected exactly as began to be the case in the Roman empire at the beginning of the second century of the Christian era. It is easy to guess what must be the natural consequences of this lop-sided arrangement.

Bankrupting Agriculture

"The cities grow bigger; industries increase in number; the luxury and needs of the masses, crowded together in the cities, augment. On the other hand, there is no proportionate increase in the productiveness of the land. And so the increase in wealth is accompanied by an increasing scarcity of the fruits of the earth, and the things which serve to clothe and feed us nearly all rise in price much more than do manufactured goods.

"And can we honestly declare that our epoch is untainted by the mania for grandeur and display which caused the ancient Roman empire to squander such vast treasures and cloaked its fatal decadence with a vesture of splendor? I cannot suppose that our freedom from such taint would be maintained by anyone who remarked the headlong growth of public and private luxury, the ever swelling vanity of nations, professions and classes, the tendency to mistake in everything the grandeur of colossal proportions for the grandeur of intrinsic virtue.

"The history of Rome admonishes us to distrust this illusion and to sound the spirit of our civilization to its deepest depths—that spirit which to us seems a limpid mirror of perfection while it is really very much the opposite. The vices, the faults, the depraved inclinations of twenty centuries ago remain the same today and modern civilization would be guilty of the gravest of errors, if, deaf to the great lesson preached by the ruins of Rome, she boasted of those very defects which destroyed in the ancient world one of the greatest works of human brain and energy that history has to offer."

FLORIDA AUTOMOBILES SHOW 500 PER CENT INCREASE

The July Motorist, the monthly magazine of the Florida State Automobile Association, is in the mails, and in looking this issue over we are impressed with its general beauty, both inside and out. The front cover design shows St. Petersburg on the Bay in silhouette and is very artistic. The inside pages are devoted to featuring St. Petersburg and to the important good roads propaganda of the day.

Under caption of the "How of State Bonds for Roads" is printed for the first time in the state a table showing total registrations of automobiles in all states for the past five years. Florida increase is shown at 500 per cent for that period, and 42 per cent increase of 1919 over 1918, and a total number registered in 1919 of 67,000. The automobile association is to be congratulated on getting out such a splendid good roads magazine as the Florida Motorist, and it has a bright field in the promotion of good roads in Florida, progressive legislation, and the other departments to which it is dedicated.

This number of the Motorist carries a general invitation to all good roads workers to attend the "Big Rally" at St. Augustine on the 29th and 30th instants, when the constitutional amendment to be voted on in November will be discussed in all its details. This two-day picnic affair will be under the auspices of the legislative committee of the Florida State Automobile Association, and is for the purpose of getting full and free discussion from all organizations and individuals interested in the future of Florida's road building.

WHITEFLY FUNGUS READY FOR DISTRIBUTION

The Entomological Department, of the State Plant Board, now has ready for distribution a supply of the Red Aschersonia and the Yellow Aschersonia. These two fungi are natural enemies of the common and the cloudy-winged whiteflies of citrus. A culture, which is the amount of fungus that can be readily grown in a wide-mouthed pinto bottle, is sufficient to treat one acre of a grove. These pure cultures are to be preferred to the fungus obtained on leaves, because by their use there is no danger of getting any other disease in the grove. Directions for applying fungus accompany each shipment. The price is 75 cents per culture, approximately the cost of production.

Dr. Berger, entomologist, says: In localities where some of the cloudy-winged whitefly is present or where it is the only species, we recommend using some of the yellow aschersonia as well as the red. To determine whether the cloudy-winged species is present, I would urge that all growers ordering fungus or making inquiry, send us 20 or 30 leaves, collected at random from the worst infested trees, for examination.

Growers are also expected to remit with each order. Orders not accompanied by remittance will be sent C. O. D. Orders for 1 to 3 cultures will be sent by parcel post only when postage is included. Shipping weights: 1 culture, 2 pounds; 2 cultures, 4 pounds; 3 cultures, 5 pounds. All remittances should be made payable to the State Plant Board of Florida and correspondence addressed to Entomological Department.

EXCHANGE SUPPLY COMPANY HOLDS ANNUAL MEETING

The annual stockholders' meeting and the election of officers of the Exchange Supply Company was recently held at the Tampa Yacht and Country Club, Tampa, Fla.

President J. H. Ross presided. The annual report as read by Manager W. F. Miller evoked much enthusiasm. In commenting upon it, President Ross said the showing made was a magnificent one, and that the growers were to be congratulated at the remarkable progress being made. In token of appreciation for their services the entire board of directors were re-elected amid much enthusiasm. The directors are: J. H. Ross, C. E. Stewart, Jr., A. F. Wyman, D. C. Gillett, J. W. Sample, A. G. Hamlin, C. H. Walker, W. W. Birchfield. The old officers were re-elected as follows: J. H. Ross, president; D. C. Gillett, vice-president; C. E. Stewart, Jr., secretary and treasurer, and W. F. Miller, manager; D. C. Giles, assistant treasurer.

Arrangements were begun for the liquidation of the Growers Land & Livestock Co., earlier organized as a timber holding company to provide a source for crate material. This company is to be taken over directly by the Exchange Supply Company following the necessary formalities.

News of California Citrus Growers

The Greek citrus crop for 1920 is estimated at 302,000,000 of the larger oranges and 53,000,000 of the Mandarin class. The citron crop from the Island of Crete is regarded as more or less of a failure this year.

The U. S. department of agriculture admits that there is some basis for the saying: "Three days' rain and then a frost," in Farmers Bulletin 1096 on "Frost and Prevention of Damage from It." Much space is given the subject of citrus orchard heating in California and experiments carried on at Pomona by Floyd D. Young, meteorologist, W. S. Jones of Claremont and Dr. I. G. McBeth of Whittier.

Albert S. Lewis of Upland addressed the meeting of the Claremont, San Dimas and La Verne farm center recently on "Lemon Root Above the Bud Union." He told of having used dried blood to bring back to production some trees whose roots had been allowed to grow above the bud union. After systematically treating them for two years the trees, he declared, produced more fruit than they had ever done before.

The State Industrial Welfare Commission has ordered that after July 24 women workers in packing houses must receive a minimum wage of $16 a week, instead of $13.50. The apprenticeship period was fixed at two weeks and the minimum scale was advanced $2 a week to $12. Overtime at "time and a quarter" was permitted for women workers in green fruit. Dried fruit workers are limited to a strict eight-hour day.

Harry S. Smith and H. M. Armitage, entomologist and assistant entomologist of the state department of agriculture, have, in the current issue of the Monthly Bulletin of the department, a carefully prepared and excellently illustrated article on "Biological Control of Mealy Bugs in California." In the introduction Director Hecke stated that it is estimated that three million dollars were spent last year by citrus growers in the control of insect pests.

An eastern bound Santa Fe refrigerator car loaded with California oranges left the track on the north slope of the Cajon Pass near San Bernardino, a short time ago, and wrenched itself loose from the rest of the train, turned turtle and rolled down the bank, but in doing so struck a switch rod in such a manner as to open the switch and safely divert the balance of the train to a sidetrack. Railroad men say this really happened, but admit that it is well-nigh unbelievable.

Farmers Bulletin 1101, recently issued by the department of agriculture, treats on the Argentine ant, which is declared to be by far the most serious ant pest. Reference is made by the writer, E. R. Barber, to the damage this ant does to citrus orchards, owing to the attraction from honey dew of the aphids and scale insects. California is one of the locations chiefly affected. The banding method of protecting trees recommended by R. S. Woglum and J. D. Neuls and the formula for syrup are recommended as methods of control.

J. R. Arthur of Lemon Cove, Dr. W. A. Connoly of Los Angeles and W. L. Dunn of Oxnard have been elected members of the Lemon Men's club.

Many citrus pruning demonstrations have been held by Farm Advisor R. W. Hodgson of Los Angeles county, during June. Scaly bark control demonstrations were also held in certain towns.

The 156-acre Jepson ranch at the entrance to Dayton canyon, near Owensmouth, San Fernando valley, is set out to 16,300 citrus trees. There are Eureka lemons, Valencia oranges and Marsh seedless grapefruit about five years old. J. Jepson lives on the property and gives his personal attention to this orchard, which is becoming one of the show places of the valley.

Claud Stone, a progressive citrus fruit grower of Pasadena, who has kept consistent records of the performance of his trees for a long term, has disposed of 40,000 selected buds from his orchard to the Fruit Growers Supply Co. Mr. Stone has recently added 15 acres of oranges and lemons to his holdings. He is a son of Thomas Stone, a pioneer citrus grower in Pasadena.

The number of orange trees shipped from other counties into Los Angeles county for planting this season was 11,350, lemons 1,660; while there was shipped from Los Angeles county elsewhere for planting 13,993 orange trees and 12,299 lemon trees. The whole number of nursery plants and trees which passed through the county horticultural commissioners' department this season was 391,196.

The headquarters of the office of pest control of the state department of agriculture will hereafter be at Whittier. The two insectaries at Alhambra will be discontinued and the work will be consolidated under one roof at the pathological laboratory at Whittier. This laboratory has been turned over to the state department of agriculture by the University of California, but two rooms will be reserved there for the use of the citrus experiment station. The building is a large one and well adapted for the work of the pest control office.

D. B. Mackie, field entomologist for the state department of agriculture, went to Oregon to install a system of vacuum fumigation for dehydrated vegetables for the Kings Food Products Co. Mr. Mackie's vacuum methods of fumigation are attracting a great deal of attention. The picking box sterilizer which he devised is in operation at the San Dimas plant of the Exchange Orange Products Co. The sterilizer can be adjusted to the capacity the belt will run. From four to six boxes are passed through the sterilizer per minute by means of a conveyor. The box is subjected to 30 to 40 pounds steam pressure.

In order to properly impress the national convention with the delicious fruit of which they may partake next year in case the convention of the order is held here, members of Jinnistan Grotto No. 76 took with them a carload of oranges and a half-car of olives to Kansas City on their recent pilgrimage from Los Angeles.

Somewhat extended reference is made in the Experiment Station Record, Vol. 42, No. 5, to the article by J. F. Breazeale of Chula Vista on the subject: "Response of Citrus Seedlings to Salts and Organic Extracts." The paper appeared in the Journal of Agricultural Research and the writer presented the results of experiments conducted chiefly at Riverside in connection with investigations as to causes of malnutrition of citrus trees.

CITRUS DEVELOPMENT IN SOUTH TEXAS

(Continued from Page 5)

more under construction. The business portion of the town is being built up very rapidly with good, substantial brick or concrete buildings and the streets are all being paved.

For the last winter's planting there were shipped into this district approximately two hundred and fifty thousand trees, and if our nursery had had them to dispose of, we could have sold two hundred thousand trees there for next year's delivery. As a matter of fact, they are not going to be able to get more than fifty per cent of the trees that are going to be required for next year's planting from the nurseries in Florida. There seems to have gotten out an erroneous impression that Texas wanted all the very poor, scrubby nursery stock from Florida that could not be sold to people in Florida. This is quite opposite to the truth. They are planting the very best, large trees that money can buy, and are willing to pay the price if they can get the proper goods.

From what I could see of conditions there, I would think that Texas will be able to raise fruit at about sixty per cent of what it costs us to raise it in Florida. Fertilizer is absolutely unknown, and for some years at least they will not have to do any spraying at all. However, I do not anticipate that Texas will ever be able to interfere or compete with Florida fruit to any great extent as their freight rates to New Orleans are greater than our freight rates to our principal markets. As a consequence, we will always be able to market our fruits as against them. They will interfere more largely with the California products than they will with ours as they can get into some of the extreme western states on a competitive basis as far as freight rates are concerned.

Trees make a wonderful growth in the rich soil and under the system of irrigation in vogue there. I saw trees that had been shipped to Texas in March, 1919, that calipered one inch at the time of shipment, which now have an average caliper of a little over two inches, are five feet in height and heavily headed.

While I was there, the cabbage shipping season was at its height, about 175 cars of cabbage being shipped each day from the various sidings in the district. This cabbage was being loaded loose and was paid for at the platform at the rate of $35 per ton.

I was in a potato field near Brownsville which contained five hundred acres. The estimated crop was about 150 bushels per acre. A Chicago commission house had purchased this crop on a basis of fourteen cents per pound f. o. b. cars Brownsville.

This district is spoken of by the Mexicans as "El Jardin," which interpreted into English, means "garden," and I can say that it comes about as near being a garden as anything I have ever seen. Where the clearing has been done and the water applied, and where the country now "blossoms as the rose," was the most desolate place that I ever saw prior to the advent of the improvements.

Summing up, I believe that the Texas growers are going to make a success of citrus culture, but I do not believe that Florida fruit men need "view with alarm" their advent into the field of citrus culture. They will be able to supply a market which we have never been able to reach, but they will never be able to invade the fields which we claim as our very own.

ORANGE VINEGAR BY RAPID PROCESS

(Continued from Page 13)

cloths. A press of 2,500 gallons capacity, with steam pump installation, racks and cloths included, costs about $2,500.

The price of a 4x12 foot generator, with a capacity of 2½ barrels every 24 hours, is approximately $55. The cost of feed tanks and collecting tanks had best be estimated at the nearest source of local supply. At least twice the capacity of the plant should be provided for in these tanks. Fermentation tanks, which should also be provided for locally, ought to have a capacity about eight times that of the generators.

Summarizing these data, a small plant using a hand power hydraulic press, with a capacity of 250 gallons per day, could be established for about $2,000. A 50-barrel plant, producing 2,500 gallons per day, would cost in the neighborhood of $4,500, using a steam power hydraulic press. A continuous type press would add decidedly to the cost of this installation, the probable increase being about 50 per cent. For a 100-barrel plant, that is, one producing about 5,000 gallons per day, the figures given can be doubled. These prices may be reduced approximately $800 by omitting bottling and filtering machines, which are not absolutely necessary, the cost of which is included in all these estimates.

Cost of Production—Material

Cost of production will vary with every plant and no accurate figures are possible, especially at this time when the cost of labor and of materials fluctuate greatly. The cost of the raw material, fruit, is perhaps the item which can be estimated most accurately. The demand for cull oranges has greatly increased in the past two or three years, and prices have risen rapidly. Each year, however, a comparatively large amount of frost injured fruit, the value of which as vinegar material has been somewhat lessened, is practically available only for making vinegar and producing peel. This material can be had for the cost of hauling it to the factory. Average hauling costs should not exceed $3 per ton. Fruit will cost all the way from this amount to $20 per ton, depending upon the crop, the market, and the demand from other sources. Severely frosted fruit yields as little as 40 gallons to the ton, while sound culls average about 80, often running as high as 100 gallons to the ton.

A slight shrinkage amounting to from two to five per cent, occurs from evaporation and losses in filtering and bottling. Taking the general run of culls from year to year, the average yield should be close to 70 gallons of vinegar per ton of fruit.

Pressing and Converting

Few apple vinegar factories divide the costs of pressing and converting the juice. In most cases, the figures obtained cover the total manufacturing cost, including overhead. As this cost includes the cost of apples, the figures are not comparable with those from plants using oranges, and the matter is further complicated by the fact that apples yield as high as 180 gallons of juice per ton. Before the recent wave of high costs, apple vinegar manufacturers freely estimated the cost of converting juice to vinegar at 1 cent per gallon. This had risen to 3 cents in 1915, and is now probably nearly 5 cents. Everything considered, this year 10 cents a gallon will not be too low an estimate for the total manufacturing cost, including overhead, and many factories will not reach so low a figure. With this data, it is not hard to estimate roughly what the cost will be per gallon to place orange vinegar on the market.

Good labels cost approximately from $5.50 per thousand in 10,000 lots, to $1.80 per thousand if purchased by the million. Bottles, one-

fifth gallon size, are about $9 per gross, car lots, or $9.90 less than carload lots. Full quarts are 40 cents higher.

Table 1 shows at a glance the cost of production, based on a yield of 70 gallons of vinegar per ton, under various conditions. The manufacturing cost is placed at 10 cents per gallon. The costs vary from 21 cents per gallon in old vinegar barrels to 68 cents in one-fifth gallon, crown cap bottles, with high-grade labels. Good grades of cider vinegar are retailing in Los Angeles in quart bottles at 80 cents per gallon, with special eastern brands up to $1.40 per gallon. Alleged cider vinegar in bulk retails as low as 35 cents. Therefore, with fruit at over $5 per ton, there is little chance to compete with low-grade bulk goods, even locally. But put up in quart bottles under well-established brands, there is no reason why the product cannot compete with any fancy grade of cider vinegar now on the market.

It would be foolish, of course, to claim that even at the present time orange vinegar could generally compete with the apple product sold in bulk or with the cheaper vinegar, such as sugar vinegar or distilled vinegar. There is, however, a legitimate place in the market for the product properly made, tastefully packed, and backed by some judicious advertising. As far as quality is concerned, there is no reason why it cannot compete with the best selling brands of any type.

ORANGE CULTURE IN CALIFORNIA

(Continued from Page 6)

the method outlined above approaches sub-irrigation more nearly than any other. Much more benefit can be derived from the same amount of water when it is run three days instead of two, the third day leaving more water in the ground than either of the others.

California soil is known to be naturally rich, and when orange trees are planted on virgin ground they will usually do well for the first few years without any application of fertilizer. In sections where the soil is shallow it is expedient to apply a fertilizer every year from the time the trees are planted.

Experience of orange growers proves that the quantity of fruit may be increased and the quality improved by fertilization. The extent and character of fertilizing is obviously dependent upon local conditions. The new man will observe and follow the practice of the most successful growers in his immediate locality.

California soil is rich in all subsidiary elements necessary for orange culture, and the intelligent grower will see that his trees do not suffer for want of nitrogen, phosphoric acid and potash, the elements which the crop draws annually from the ground and which must be replaced.

The generally accepted method of enriching the soil is to place the best manure and the most of it that is practicable upon the orchard with its first fertilization, and "piece it out" afterwards with such commercial fertilizers as local experience has proven profitable. In many orchards a green fertilizer is planted, cow peas or vetches being considered the best two for a cover crop to be turned under in the spring.

CONTROL OF LARGE PLANT-BUGS

(Continued from Page 7)

first, leaving the middles to be cut later. There are but few winged adults at that season, but there are many wingless nymphs which cannot fly nor crawl far. This method of cutting drives these young away from the trees into the middles, where they will perish when the last of the crop is cut. As a result, there will be but few others produced before cold weather puts an end to their breeding. Neglect of the cover crop does not always result in an outbreak of bugs, for other factors may enter in to keep them down, yet it is a dangerous practice.

Other Plant Bugs

Mingling with the pumpkin bugs are occasional specimens of the northern green soldier bug, Nezara hilaris. More common is the brownish-gray stink bug, Euchistus variolaris.

The leaf-footed plant-bug, Leptoglossus phyllopus L., and the big-thighed plant-bug, Acanthocephala femorata (Fab.), although more common in truck gardens, sometimes attack citrus fruits. Thistles, on which the bugs congregate in large numbers, should be cut out of the citrus groves.

Control measures for all four of these insects is the same as for the pumpkin-bug.

Cotton Stainer

This dark red bug which gets its name from its habit of feeding in cotton bolls, the lint of which it stains red, sometimes invades citrus groves in hordes and attacks the fruit in the same manner as the pumpkin-bug. The cotton stainer is markedly gregarious; scattering specimens are seldom seen. In some years large numbers invade the groves and then for several years they will be almost entirely absent. The opinion is quite general that the growing of cotton in the vicinity of citrus groves is responsible for these invasions. But the fact that the insect shows in cotton fields the same tendency to be abundant during occasional years only, as in citrus groves, casts some doubt on the question.

The mature bug is a little less than a half inch long and is about three-sixteenths of an inch wide. Its shape is between oblong and oval. The head and most of the thorax and the base of the legs are red. The wings are dark brown edged with yellow. When the wings are crossed over the back in the manner characteristic of the true bugs, these yellow edges form two rather conspicuous lines which cross diagonally on the back. This is a tropical and subtropical insect which becomes more abundant toward the south.

Control

These bugs may be collected in the same way as the pumpkin-bugs. Also, advantage may be taken of their fondness for cotton seed by placing small piles of the seed under the trees. The bugs will collect on these piles, where they can be sprayed with kerosene or, better, killed with a gasoline torch. By using the torch the seed will last for some time, but if sprayed with kerosene the seed becomes unattractive to the bugs and will have to be renewed.

JONES BUYS GROVE

Hugh G. Jones of Arcadia became the owner of the J. H. Treadwell 20-acre bearing orange grove on the Nocatee-Owens public road, in the Owens section. The consideration was $10,000. This is one of the prettiest orange groves in the Owens district and Mr. Jones is to be congratulated on his purchase. Mr. Treadwell disposed of this grove so he could give more of his attention to his large grove near this one.

Over 2,000 Oranges From One Lone Tree

One tree in the F. P. Kennedy grove, five miles west of Miami, on the 12th street road, bore 2,007 oranges this last season. The tree is 17 years old, of the Valencia variety. Another tree in the Kennedy grove produced 1650 oranges and from a third tree 1580 oranges were picked.

Palestine Seeks Florida Boxes

Oranges from the Holy Land may be packed in Florida-made boxes if queries received by H. H. Abrams of Tampa, lead to results. A New York importing house has written Mr. Abrams to inquire as to the possibility of obtaining 12,000,000 orange boxes for packing the crop in and around Jaffa, Palestine. Specifications for the needed boxes accompanied the inquiry. Henry being a Kiwanian, quit everything else to help Secretary Dickie, of the Tampa Board of Trade, get in touch with citrus crate makers, and every effort will be made to supply the need of the Palestine growers.

A NEW CITRUS FRUIT

Some pear-shaped grapefruit were presented to the farm bureau recently from the orchard of Mr. White of Calexico. This fruit is a novelty, being a cross between the grapefruit and the orange, developing out of the breaking off of an orange tree by the wind. The new growth produced the pear-shaped grapefruit, which is said to be finely flavored.—El Centro (Calif.) Progress.

CLASSIFIED ADVERTISEMENTS

The rate for advertisements of this nature is only three cents per word for each insertion. You may count the number of words you have, multiply it by three, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

THE CITRUS INDUSTRY,
411 Curry Bldg., Tampa, Florida

Citrus Growers:

Here is a Tractor that has proved itself the satisfactory solution of the labor and feed situation. . . . .

The Oldsmar Garden Tractor

Efficient Durable Economical

Is the ideal machine for the small grower.
Write us and let us tell you more about
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The Oldsmar Tractor Company
Oldsmar, Florida

REAL ESTATE

The Best Bargain in Hernando County—320 acres of extra choice citrus and farming lands. 55 acres in young orange grove, 50 acres in corn, peas, beans, etc. The balance in timber, pasture and cut-over lands that are easily cleared. All very high and gently rolling, well drained and no waste land on the place. A nice new 5-room house with porch half way round. Good well at house, and nice spring furnishes running water for stock. Barn, corn crib, and other out houses. About 750 rods of new woven wire fences. Hard road across one side of place, and convenient to new $14,000 school. If sold within 30 days I will take $60 an acre, and put in 2 good mules, 2 cows, 22 hogs, and 139 chickens, and all farming implements. If you want a real snap then write or see H. A. Chadsey, Brooksville, Fla.

205 ACRES—Orchard and stock farm. 4,000 bearing apple trees, 99 acres in orchard, 45 in other crops, balance in timber. Good buildings and water. Long terms. Low interest. W. H. Funk, Dixon, Mo.

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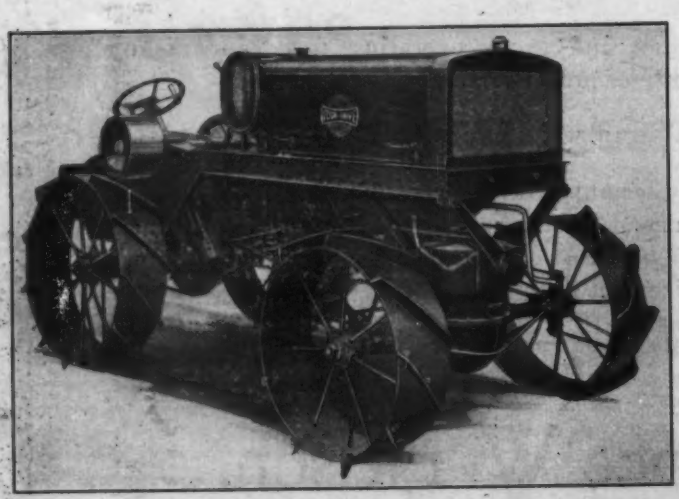

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